CLAIMS

1. A multiple transmission channel wireless communication system comprising a transmitting station (10) and at least one receiving station (12), at least one of said stations having an antenna system (14) comprising a plurality of spaced apart antenna elements (16A,B), each antenna element comprising a sub-array of at least 2 antennas (20A,B) separated by less than $\lambda/2$ of the frequency of interest.

2. A system as claimed in claim 1, characterised in that the antennas (20A,B) of a sub-array are coupled to an RF network (18A,B) for processing signals received by the antennas.

3. A system as claimed in claim 1 or 2, characterised in that the antennas (20A,B) of each sub-array are spaced apart by less than $\lambda/4$.

4. A system as claimed in claim 1, characterised in that a hybrid coupler (42A,B) couples together the antennas of each sub-array.

5. A system as claimed in claim 1 or 2, characterised in that the antennas (20A,B) of a sub-array are switchable to achieve directional propagation or reception.

6. A system as claimed in claim 1, characterised in that the antenna systems (14) form multiple orthogonal antenna beam patterns.

7. A system as claimed in claim 1 or 2, characterised in that the sub-arrays comprise antennas (20) arranged to give orthogonal polarisation.

8. An antenna system for use in a multiple transmission channel wireless communication system, the antenna system comprising a plurality of spaced apart antenna elements (16A,B), each antenna element comprising a

sub-array of at least 2 antennas (20A,B) separated by less than $\lambda/2$ of the frequency of interest.

9. An antenna system as claimed in claim 8, characterised in that the antennas (20A,B) of a sub-array are coupled to an RF network (18A,B) for processing signals received by the antennas.

10. An antenna system as claimed in claim 8 or 9, characterised in that the antennas (20A,B) of each sub-array are spaced apart by less than $\lambda/4$.

11. An antenna system as claimed in claim 8, characterised in that a hybrid coupler (42A,B) couples together the antennas of each sub-array.

12. An antenna system as claimed in claim 8 or 9, characterised in that the antennas (20A,B) of a sub-array are switchable to achieve directional propagation or reception.

13. An antenna system as claimed in claim 8 or 9, characterised in that the antenna systems (14) form multiple orthogonal antenna beam patterns.

14. An antenna system as claimed in claim 8 or 9, characterised in that the sub-arrays comprise antennas (20) arranged to give orthogonal polarisation.